General

Guideline Title

Assessment of comorbidities. In: II guidelines for perioperative evaluation.

Bibliographic Source(s)

Gualandro DM, Yu PC, Calderaro D, Marques AC, Pinho C, Caramelli B, et al. Assessment of comorbidities. In: II guidelines for perioperative evaluation. Arq Bras Cardiol. 2011;96(3 Suppl 1):43-54. [379 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Committee on Perioperative Evaluation (CAPO), Brazilian Society of Cardiology. General approach to the patient. In: I guidelines for perioperative evaluation. Arq Bras Cardiol 2007;89(6):e175-86.

Recommendations

Major Recommendations

The definitions for levels of evidence (A-C) and classes of recommendation (I-III) are provided at the end of the "Major Recommendations" field.

Thyroid Disease

Hypothyroidism

General Recommendations

Degree of Recommendation I, Level of Evidence C

- Assess all risk factors of the patient.
- Do not worry about subclinical hypothyroidism when thyroid stimulating hormone (TSH) value <10 mU/dL.
- Elective surgery should only be performed when the patient is euthyroid.
- Patients <45 years old should receive full dose of L-thyroxine, which is usually 1.6 to 2.2 mcg/kg or 100 to 200 mcg a day. TSH levels normalize only after 4 to 6 weeks of appropriate dosage.
- Patients older than 45 years should start with 25-50 mcg/day, with the dose increasing every 2 weeks.
- Coronary patients should receive 15 mcg/day and this dose should be increased every week until a normal TSH.
- Do not postpone surgery in patients with hypothyroidism, but start oral hormone replacement.
- In surgical procedures with hypothyroidism, prophylaxis of hypothermia, cardiovascular monitoring and hydrocortisone 100 mg every 8

hours in 24 hours should be performed because of the chance to adrenal insufficiency.
- T4 has a half life of 7 days while T3 has a half life of 1.5 days. That is the reason why the user of T4 does not need to take it on the day of surgery, while the user of T3 should do it.
- To evaluate the possibility of difficult intubation due to goiter using radiography of the cervical region.

Recommendations for Urgent Surgery in Patients with Severe Hypothyroidism or Myxedema Coma

Degree of Recommendation I, Level of Evidence C

- Administer 200-500 mcg of L-thyroxine or 40 mcg of intravenous T3 or 10-25 mcg of T3 every 8 hours before surgery, which corrects the hemodynamic and electrocardiographic changes. In the perioperative period, divide the dose by 50% T4 and 50% T3.
- The maintenance dose should be 40 to 100 mcg of T4 and 10 to 20 mcg of T3 intravenously every 24 hours.
- Administer 100 mg of hydrocortisone every 6 hours for a long time.
- As soon as possible, start hormone replacement by using the doses described above.

Hyperthyroidism

General Information

Degree of Recommendation I, Level of Evidence C

- Parallel evaluation by an endocrinologist should be strongly considered in the perioperative period of patients with hyperthyroidism.
- Before the elective surgery, patients should be adequately treated with medication for hyperthyroidism.
- Thyroid medications - the most commonly used are propylthiouracil (PTU) and methimazole. These drugs inhibit the synthesis of thyroid hormones by preventing oxidation and organification of iodine. PTU has the additional benefit of inhibiting the peripheral conversion of T4 to T3 at higher doses, therefore, it is most commonly used in the perioperative period. The usual dose is 100 mg every 8 hours and the maximum dose is 400 mg every 8 hours. The doses of methimazole vary from 10 to 120 mg at a single dose. The dose should be reassessed every 4-6 weeks. Adverse effects are rarely severe: skin rash, fever, rash and arthralgia, transient elevation of liver enzymes, and leukopenia. Agranulocytosis (0.5%), severe hepatitis, lupus-like syndrome, and thrombocytopenia are more severe and less frequent adverse effects and require discontinuation of medication.
- Beta-blockers - the most used is propranolol at a dose of 10-80 mg every 6-8 hours (1 mg intravenous intraoperatively). Esmolol can be administered during surgery with a loading dose of 500 mcg/kg over 1 minute and maintenance of 25-300 mcg/kg/min.

Recommendations for Emergency Surgeries or Urgent Procedures

Degree of Recommendation I, Level of Evidence C

- Antithyroid drug - the drug of choice is PTU at high doses (1000 to 1200 mg divided into three doses).
- Beta-blockers - prefer intravenous administration
- Iodine - can be used for a maximum of 10 days since the inhibition of organification is transient (Wolff-Chaikoff effect) and after that time there is escape and worsening of hyperthyroidism.
- Lugol's solution, which contains 5% iodine and 10% potassium iodide, is the most used at a dose from 0.1 to 0.3 ml every 8 hours (3 to 5 drops).
- Iodinated contrast - ipodate sodium and iopanoic acid are used to compensate, with the advantage of giving less escape and inhibit the peripheral conversion of T4 to T3. The dose is 500 mg every 8 hours.
- Corticosteroid - must be administered when there is no compensation of hyperthyroidism in the intraoperative and postoperative periods due to higher peripheral degradation of cortisol. The dose is 100 mg at induction and 100 mg every 8 hours for 24 hours.
- Anesthesia - increased metabolism of anesthetic drugs and risk of difficult intubation because of goiter should receive special attention.
- Thyrotoxic storm - is associated with mortality rates of 20%-30%. Based on the clinical abruptness, the treatment described in the information above should be initiated promptly, even without laboratory confirmation.

Treatment of Thyrotoxic Storm

- Hydration
- Cooling
- Inotropes
- PTU attack (1000 mg gastrointestinal tract)
- PTU maintenance 200 mg every 6 hours

- Ventilatory support
- Metabolic control through the digestive system
- Hydrocortisone attack 300 mg intravenously
- Maintenance of 100 mg hydrocortisone every 8 hours
- Iodine in the form of Lugol through digestive tract or intravenous iodine at a dose of 1 g every 8 hours
- If necessary, plasmapheresis, dialysis, or cholestyramine to remove hormones from the circulation

Adrenal Insufficiency

Clinical Picture of Adrenal Insufficiency

- Hypotension and hemodynamic shock (which may be resistant to vasopressors) with multiple organ dysfunction
- Hypoglycemia
- Tachycardia
- Electrolyte disturbances: hyponatremia, hyperkalemia (primary AI), hypercalcemia, and acidosis
- Hypocontractility rate
- Anemia, neutropenia, and eosinophilia
- Nausea, vomiting, weakness, orthostatic hypotension, dehydration, abdominal pain or flank pain (acute adrenal hemorrhage), fatigue, and weight loss
- Vitiligo, abnormal skin pigmentation, hypogonadism, and hypothyroidism
- One should suspect the diagnosis of AI if in the intra- or postoperative periods there is unexplained hypotension or shock or refractory to volume and drugs, discrepancy between disease severity and patient status, high fever without apparent cause (negative cultures) or if the patient does not respond to antibiotic therapy, unexplained mental changes, apathy, or specific psychiatric disorder. These cases should be treated as adrenal insufficiency (AI) and confirmed later; Degree of Recommendation I, Level of Evidence C.

Identification of Patients at Risk of AI

- Patients with a diagnosis already established of AI
- Patients at risk for AI and patients with relative hypoadrenalism (limited adrenocortical reserve)
    - Pituitary tumors (macroadenomas)
    - Radiotherapy in the pituitary region
    - Previous pituitary surgery
    - Postoperative period of Cushing's disease, bilateral adrenalectomy, or unilateral adrenalectomy in case of other adrenal affected
    - Chronic corticosteroid use (>7.5 mg prednisone or equivalent for more than 30 days or >20 mg for more than two weeks)
    - Patients with type 1 diabetes or autoimmune diseases (Hashimoto's disease, ovarian or primary testicular failure, hypoparathyroidism, and vitiligo)
    - Individuals with suggestive symptoms (darkening of the skin, weakness, fatigue, nausea, vomiting, depression, hypotension, electrolyte disturbances, hypoglycemia, and fever)

Recommendations

Degree of Recommendation I

- Confirm the diagnosis by means of appropriate tests for patients at risk for AI and consider follow-up by an endocrinologist; Level of Evidence B.
- In cases of need for confirmation of AI by means of tests, use dexamethasone that does not interfère with the evidential test; Level of Evidence C.
- In cases of coexistence of hypothyroidism and untreated AI: first correct AI; Level of Evidence C.
- No need for mineralocorticoid supplementation because the doses of corticosteroid supplementation in surgical stress have mineralocorticoid activity; Level of Evidence C.

Degree of Recommendation IIa

- If unable to confirm the diagnosis before surgery, the authors of the original guideline document recommend the corticosteroids supplementation as shown below; Level of Evidence C.

Supplemental Doses of Corticosteroids

Degree of Recommendation IIa

- No need for high doses of supplemental corticosteroids for prevention of AI; Level of Evidence B.
- High doses may increase the chance of complications such as hypertension and diabetes decompensation; Level of Evidence C.

Mild Surgical Stress

Degree of Recommendation IIa

- Doubling or tripling the dose of corticosteroids in patients with established AI and chronic users, noting that adrenal suppression can occur rapidly with high doses or even after a long time without using corticosteroids (up to 48 months); Level of Evidence C.
- If the patient is fasting, supplement with 50 mg of intramuscular or intravenous hydrocortisone immediately before surgery and 25 mg of hydrocortisone twice a day or equivalent (dexamethasone 0.75 mg twice a day), reducing to the regular dose in 24 hours or once stress ceases; Level of Evidence C.

Degree of Recommendation IIb

- In patients without an established diagnosis and strongly suspected, treat for AI; Level of Evidence C.

Moderate Surgical Stress

Degree of Recommendation IIa

- Additional 25 mg of hydrocortisone or equivalent, intramuscular or intravenous 8/8 hours, starting on the morning of surgery, with 50% reduction in dose per day until the usual dose; Level of Evidence C.

High Surgical Stress

Degree of Recommendation IIa

- Supplemental hydrocortisone 50 mg/day or equivalent 6/6 hours with a 50% reduction in the dose per day until the usual dose once metabolic stress disappears (usually it lasts for 48 hours following surgeries for infections or other complications); Level of Evidence C.

Special Situation of Cushing's Syndrome

- It is advisable to ask for monitoring performed by an endocrinologist.
- Start the steroid upon arrival to the intensive care unit or the day after the surgery.
- In these cases, some groups of corticosteroids should be used only if there are symptoms, signs or laboratory results of AI.

Obesity and Bariatric Surgery

Obesity is related to comorbidities that influence the perioperative evaluation and management, such as atherosclerosis, heart failure, hypertension, pulmonary hypertension, deep vein thrombosis, and low functional capacity.

Severity of obesity may be characterized by different degrees:

- Obesity grade 1 body mass index (BMI) from 30 to 34.9 kg/m^2
- Obesity grade 2 BMI from 35 to 39.9 kg/m^2
- Obesity grade 3 BMI $\geq$40 kg/m^2

Classifications used in bariatric surgeries still categorize obesity in grade 4 and 5 when BMI is higher than 50 and 60 kg/m^2, respectively.

Specific Recommendations for the Preoperative Evaluation According to Body Mass Index (BMI) and Surgical Size

Obesity of Any Degree and Minor Surgery

Degree of Recommendation IIa

- Assessment similar to nonobese individuals; Level of Evidence D

Obesity Grade 1, 2 and 3 and Intermediate and Major Surgery

Degree of Recommendation I

- History and physical examination
- Clinical evaluation of obstructive sleep apnea using appropriate score; Level of Evidence B

Degree of Recommendation IIa

- Electrocardiogram (ECG) if the patient is over 40 years or has a risk factor for heart disease; Level of Evidence B
- Fasting glucose; Level of Evidence B
- Polysomnography in patients with positive screening scores for apnea; Level of Evidence C

Degree of Recommendation IIb

- Creatinine if patient is diabetic, has hypertension or a history of renal disease; Level of Evidence C
- For obese grade 1 and 2, echocardiogram with assessment of diastolic function if signs or symptoms suggestive of congestive heart failure (CHF); Level of Evidence C
- Echocardiogram with assessment of diastolic function for all obese grade 3; Level of Evidence C

Specific Recommendations for Very Obese Patients

Degree of Recommendation IIa

- Arterial gasometry if hypoventilation or pulmonary conditions are present; Level of Evidence C

Degree of Recommendation IIb

- Chest radiography in a posterior-anterior and lateral position; Level of Evidence C
- Noninvasive oximetry at rest and during sleep if signs of apnea; Level of Evidence C

Notes:

- The additional testing and studies of coagulation tests are not mandatory and should not be routine in the preoperative evaluation of obese individuals. Additional tests are selected based on clinical history; Degree of Recommendation IIa, Level of Evidence B.
- Bariatric procedures for resection of the stomach and gastric bypass surgeries are intermediate size surgeries.

Recommendations for Risk Reduction

Degree of Recommendation I

- Smoking cessation six weeks before surgery; Level of Evidence B

Degree of Recommendation IIa

- Physical therapy; Level of Evidence C
- If sleep apnea documented by polysomnography, consider installing continuous positive airway pressure (CPAP) preoperatively in patients who do not use CPAP and do not discontinue it in those who use it; Level of Evidence B.

Intraoperative Care

Degree of Recommendation I

- Blood pressure monitoring with a cuff appropriate for obese; Level of Evidence B

Degree of Recommendation IIa

- Reverse Trendelenburg position during induction of anesthesia in severe obese individuals; Level of Evidence B
- Pre-oxygenation (performed by providing 100% oxygen through a mask with the patient breathing spontaneously for a period of 3 minutes) or sitting with head elevated; Level of Evidence B
- Rapid sequence induction with cricoid pressure during intubation; Level of Evidence B
- Application of positive end-expiratory pressure (PEEP) improves oxygenation and prevents atelectasis; Level of Evidence B
- Stretcher suitable for obese patients and avoid injuries caused by position on the surgical bed; Level of Evidence C
- Noninvasive monitoring of oximetry in patients with hypoxemia in the preoperative period or in the presence of airway and pulmonary

disease (sleep apnea, alveolar hypoventilation); Level Evidence B

Degree of Recommendation IIb

- Consider individual invasive blood pressure monitoring; Level Evidence C.

Postoperative Care

Degree of Recommendation I

- CPAP in patients diagnosed with documented sleep apnea; Level of Evidence B

Degree of Recommendation IIa

- Post-operative care in intensive care unit of patients at high risk due to comorbidities, those who had failed on postoperative extubation, suffered complications during surgery or are super-obese (BMI >70); Level of Evidence C
- Maintaining blood volume; Level of Evidence C
- Respiratory therapy to all those undergoing intermediate to major surgery; Level of Evidence C

Degree of Recommendation IIb

- Perform continuous oximetry during recovery from anesthesia (Level of Evidence C), measurement after recovery from anesthesia (if normal, not necessary to repeat) and measured continuously during sleep (in intermediate to major surgeries in patients with sleep apnea); Level of Evidence C.

Prophylaxis for Deep Vein Thrombosis in Obese Patients

Degree of Recommendation I

- Drug prophylaxis with low molecular weight heparin (LMWH) or unfractionated heparin (UFH); Level of Evidence A

Degree of Recommendation IIb

- Higher doses (40 or 60 mg of enoxaparin every 12 hours) results in fewer thromboembolic events and may be useful; Level Evidence C.

Bariatric Surgery

Degree of Recommendation I

- For patients undergoing bariatric surgery routinely use thromboprophylaxis with LMWH, prophylactic UFH 8/8h, fondaparinux or a combination of a pharmacological method with the intermittent pneumatic compression (IPC); Level of Evidence C

Degree of Recommendation IIa

- For these patients, use higher doses of LMWH (enoxaparin 40 mg subcutaneous [SC] 12/12 h) or UFH (7500 UI SC 8/8h) than those commonly used in the prophylaxis of nonobese patients; Level of Evidence C.
- Sleep apnea, previous deep vein thrombosis (DVT) and pulmonary embolism, very high BMI and low functional capacity (factors related to worse prognosis) should be investigated. For patients with several of these factors, if possible, it should be considered to change the bariatric surgery for a type of surgery with better outcome (gastric banding only, preferably by laparoscopy) or to postpone the surgery. Level of Evidence B.

Blood Diseases

Recommendations for red blood cell transfusion in the perioperative period:

Degree of Recommendation I

- Patients with hemoglobin ≤7.0 g/dL, asymptomatic, and without ischemic heart disease should receive basic concentrated red cell; Level of Evidence A.
- In cases of acute coronary syndromes no evidence is available for limits of hemoglobin, it is recommended to maintain hemoglobin between 9.0 and 10.0 g/dL; Level of Evidence C.

Recommendations for perioperative management of patients with other blood conditions:

Sickle Cell Disease (SS/SC/Sβtal)

Degree of Recommendation I

- Careful preoperative hydration, monitoring of oxygenation and meticulous postoperative management, including respiratory therapy are indicated for all patients undergoing general anesthesia; Level of Evidence C.
- Preoperative transfusion is not routinely indicated for patients undergoing minor surgical procedures not requiring general anesthesia; Level of Evidence C.
- For younger, non-complicated patients undergoing low/intermediate-risk procedures (including laparoscopic cholecystectomy) preoperative transfusion is recommended to increase hemoglobin levels to 10 g/dL; Level of Evidence C. For patients with hemoglobin (Hb) ≥9 g/dL, it is advisable to ask the opinion of a specialist.
- Partial transfusion to reduce the level of hemoglobin S to 30% or less should be considered for high-risk procedures and patients with history of pulmonary disease requiring prolonged anesthesia; Level of Evidence C. It is advisable to ask the opinion of a specialist.

Thrombocytopenia

Recommendations for platelet transfusion:

Degree of Recommendation I, Level of Evidence B

- For any surgical procedure, when the platelet count below 50,000/mm^3;
- For neurological and ophthalmological interventions, when platelet count less than 100,000 platelets/mm^3.

Antiphospholipid Antibodies and Hereditary Thrombophilia

Recommendations for anticoagulant therapy in patients with hereditary thrombophilia or antiphospholipid antibodies:

Degree of Recommendation IIa

- For asymptomatic patients with inherited thrombophilia, the authors of the guideline recommend the use of prophylactic doses of LMWH or UFH in the postoperative period; Level of Evidence C.
- For patients with hereditary thrombophilia on use of oral anticoagulation suspension, it is recommended to use therapeutic doses of UFH or continuous infusion of LMWH in the preoperative period. When inherited thrombophilia has less thrombotic risk, low doses of LMWH may be used; Level of Evidence C.

Hemophilia A (Factor VIII Deficiency) and B (Factor IX Deficiency)

Degree of Recommendation I, Level of Evidence B

- Surgical procedures should be performed by a medical team experienced in the treatment of hemophilia.
- Before performing the procedure, ensure that there is sufficient availability of factor concentrate.
- Procedures should be performed in a center with laboratory support with adequate capacity to monitor the deficient factor.
- In preoperative laboratory evaluation, search for inhibitors of the deficient factor should always be included.
- The surgical procedure should be performed earlier in the week and earlier in the day to allow great support from laboratory and blood bank.
- For the intra-operative period, the plasma level of the deficient factor for hemostatically safe values should be corrected through the use of specific factor concentrate.
- Postoperatively, keep the plasma level of the factor deficient in adequate concentrations and time, according to the type and size of the surgery.

Von Willebrand Disease (VWF)

- Postoperatively, plasma levels of minimum coagulation factor VIII (FVIII:C) and ristocetin cofactor (VWF:RCo) will vary with the type and size of surgery.

Degree of Recommendation I

- Any surgical procedure must be based on laboratory measurements of the activity of factor VIII (FVIII:C) and ristocetin cofactor

(VWF:RCo) after administration of desmopressin (DDAVP) and/or infusion of concentrate of von Willebrand factor; Level of Evidence B.
- During the intraoperative period, the concentrations of FVIII:C and VWF:RCo should be maintained at 100 IU/dL, through the infusion of VWF concentrate with or, in responding patients, administration of DDAVP; Level of Evidence B.

Degree of Recommendation IIa

- Whenever possible, surgical procedures should be performed in a hospital with a medical team, including a hematologist and a surgeon, experienced in the treatment of bleeding disorders and specialized laboratory support; Level of Evidence C.
- In the post-operative concentrations of FVIII:C should be equal to or less than 150-250 IU/mL and VWF:RCo below or equal to 200 IU/dL to reduce the risk of thrombosis; Level of Evidence C.
- Pharmacological antithrombotic prophylaxis should be done postoperatively; Level of Evidence C.

Asthma and Chronic Obstructive Pulmonary Disease

Recommendations for the use of perioperative corticosteroids:

Degree of Recommendation IIa

- Patients with asthma

Degree of Recommendation IIb

- Patients with COPD or interstitial lung diseases

Smoking

Smoking Cessation During Hospitalization

Degree of Recommendation I

- Hospitalized patients should be actively approached regarding their history and smoking status. Smokers should be questioned regarding their intention to stop smoking and nicotine withdrawal symptoms; Level of Evidence C.
- Nicotine replacement therapy should be initiated in hospitalized smokers who experience withdrawal symptoms; Level of Evidence C.
- Patients treated during hospitalization should be followed up by at least one month after discharge to remain abstinent. Level of Evidence B.

Smoking Cessation in the Preoperative Period

Degree of Recommendation I

- Smoking cessation reduces surgical complications in this subpopulation, clinical research and patients in the preoperative evaluation should be encouraged to quit smoking regardless of the time to operation; Level of Evidence A.
- The therapeutic intervention should always include cognitive-behavioral approach with or without pharmacological treatment; Level of Evidence A.

Degree of Recommendation IIa

- Any first-line pharmacological option (nicotine replacement therapy, bupropion, and varenicline) alone or combined (nicotine gum or transdermal associated with nicotine gum or bupropion in combination with transdermal nicotine gum or lozenge) may be used in this population, respecting individual contraindications, but there is more evidence in favor of nicotine replacement therapy; Evidence Level B.

Definitions:

Levels of Evidence

A. Evidence in several populations from multiple randomized clinical trials or meta-analyses
B. Evidence in a limited group of populations from single randomized clinical trial or non-randomized clinical studies
C. Evidence in very limited group of populations from consensus and experts' opinions, case reports and series

Degree/Class of Recommendation - Reflecting the Size of Treatment Effect

Degree of Recommendation I - Benefit >>> Risk; the treatment/procedure must be indicated/administered

Degree of Recommendation IIa - Benefit >> Risk; the choice for the treatment/procedure may help the patient

Degree of Recommendation IIb - Benefit > Risk; is not defined if the treatment/procedure can help the patient

Degree of Recommendation III - Risk > Benefit; the treatment/procedure must not be performed since it does not help and may be harmful for the patient

Clinical Algorithm(s)

The original guideline document contains a clinical algorithm for treatment of hospitalized smokers.

Scope

Disease/Condition(s)

Any cardiac condition requiring surgery

Other Disease/Condition(s) Addressed

- Adrenal insufficiency
- Asthma
- Blood diseases (sickle cell disease, thrombocytopenia, antiphospholipid antibodies and hereditary thrombophilia, Hemophilia A [Factor VIII Deficiency] and B [Factor IX Deficiency], Von Willebrand Disease)
- Chronic obstructive pulmonary disorder
- Obesity
- Thyroid disease
- Tobacco dependence

Guideline Category

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Treatment

Clinical Specialty

Anesthesiology

Cardiology

Colon and Rectal Surgery

Critical Care

Neurological Surgery

Orthopedic Surgery

Plastic Surgery

Surgery

Thoracic Surgery

Intended Users

Physicians

Guideline Objective(s)

- To refine and unify the terminology used by the entire multidisciplinary team, including the patients and their family
- To establish new routines, change indication for surgery according to the information obtained during the perioperative evaluation
- To inform the patient and the team on the possible risks related to the intervention
- To decrease perioperative complications

Target Population

Any patient who requires surgery

Interventions and Practices Considered

1. Medical history
2. Physical examination, with emphasis on:
    - Identifying preexisting or potential heart disease
    - Defining severity and stability of heart disease
    - Identifying comorbid disease
3. Assessment of comorbid conditions (thyroid disease, adrenal insufficiency, obesity, blood diseases, asthma, chronic obstructive airway disease, smoking)
4. Perioperative treatment of comorbid diseases (thyroid hormone replacement, antithyroid therapy, blood transfusions, thrombosis prophylaxis, corticosteroids, respiratory physiotherapy, continuous positive airway pressure, deep vein thrombosis prophylaxis)
5. Use of additional tests, including electrocardiogram, chest x-ray, polysomnography, serum creatinine
6. Use of algorithms to direct clinical evaluation

Major Outcomes Considered

- Perioperative complications, morbidity, and mortality
- Length of hospitalization
- Cost-effectiveness
- Rates of reintervention

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The databases searched were PubMed, Scielo, and Lilacs. The guideline was updated, based on the last version of the guideline, and new evidence from 2007 to 2010 was obtained. There were no specific search terms. Articles published in Portuguese and English were included.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

A. Evidence in several populations from multiple randomized clinical trials or meta-analyses
B. Evidence in a limited group of populations from single randomized clinical trial or non-randomized clinical studies
C. Evidence in very limited group of populations from consensus and experts' opinions, case reports and series

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Degree/Class of Recommendation - Reflecting the Size of Treatment Effect

Degree of Recommendation I - Benefit >>> Risk; the treatment/procedure must be indicated/administered

Degree of Recommendation IIa - Benefit >> Risk; the choice for the treatment/procedure may help the patient

Degree of Recommendation IIb - Benefit > Risk; is not defined if the treatment/procedure can help the patient

Degree of Recommendation III - Risk > Benefit; the treatment/procedure must not be performed since it does not help and may be harmful for the patient

Cost Analysis

Renal Failure

Patients with renal failure are more prone to postoperative complications, longer hospital stay, greater costs of hospitalization, and have higher mortality than those without renal dysfunction.

Smoking

There is a consistent body of evidence substantiating smoking cessation in subpopulations of patients and candidates for surgical procedures. This intervention is extremely effective and less costly.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

Not stated

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for most recommendations (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate assessment of comorbidities which may result in reduced perioperative complications, morbidity, and mortality

Potential Harms

Adverse effects of propylthiouracil and methimazole are rarely severe: skin rash, fever, itching and arthralgia, transient elevation of liver enzymes and leukopenia. More severe and less frequent complications that require discontinuation of medication are agranulocytosis (0.5%), severe hepatitis, lupus-like syndrome and thrombocytopenia.

Qualifying Statements

Qualifying Statements

- Data or scientific evidence are not always available to allow all the different situations to be analyzed. As customary in medical practice, minute analysis of the patient and problem and the common sense of the team must prevail.
- The surgical intervention does not finish when the patient is bandaged or leaves the operating room. The concept of the word perioperative includes the need for a postoperative surveillance whose intensity is determined by the individual level of risk of the patient.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Gualandro DM, Yu PC, Calderaro D, Marques AC, Pinho C, Caramelli B, et al. Assessment of comorbidities. In: II guidelines for perioperative evaluation. Arq Bras Cardiol. 2011;96(3 Suppl 1):43-54. [379 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2007 (revised 2011)

Guideline Developer(s)

Brazilian Society of Cardiology - Medical Specialty Society

Source(s) of Funding

Brazilian Society of Cardiology

Guideline Committee

Not stated

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Financial Disclosures/Conflicts of Interest

See the original guideline document for mandatory conflict of interest declaration.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Committee on Perioperative Evaluation (CAPO), Brazilian Society of Cardiology. General approach to the patient. In: I guidelines for perioperative evaluation. Arq Bras Cardiol 2007;89(6):e175-86.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Arquivos Brasileiros de Cardiologia Web site

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Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on June 2, 2008. The information was verified by the guideline developer on July 2, 2008. This summary was updated by ECRI Institute on December 26, 2008 following the FDA advisory on Innohep (tinzaparin). This summary was updated by ECRI Institute on June 15, 2009 following the FDA advisory on Propylthiouracil (PTU). This summary was updated by ECRI Institute on May 27, 2010 following the revised FDA advisory on Propylthiouracil (PTU). This summary was updated by ECRI Institute on July 27, 2010 following the FDA drug safety communication on Heparin. This NGC summary was updated by ECRI Institute on November 16, 2011. The updated information was verified by the guideline developer on December 27, 2011. This summary was updated by ECRI Institute on January 14, 2013 following the revised U.S. Food and Drug Administration advisory on Chantix (varenicline). This summary was updated by ECRI Institute on March 10, 2014 following the U.S. Food and Drug Administration advisory on Low Molecular Weight Heparins. This summary was updated by ECRI Institute on April 8, 2015 following the U.S. Food and Drug Administration advisory on Chantix (varenicline).

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